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ABSTRACT

Investigated was the incidence of learning disabilities in juvenile delinquents at a Rhode Island Training School. Ss and nondelinquent controls were administered the Halstead-Reitan battery of measures including the Wechsler Intelligence Scale, the Wide Range Achievement Test, and tests of sensory imperception. Results found the five predictors utilized (Verbal IQ, Performance IQ, Halstead's Impairment Index, the Trailmaking Test Part A, and the Trailmaking Test Part B) discriminated significantly between delinquent and nondelinquent groups with 87 percent of the delinquents and 78 percent of the controls being correctly classified as a result of the five neuropsychological indexes. The most powerful individual predictors were the Performance IQ and the Impairment Index. (DB)

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Incidence of Learning Disabilities in Juvenile Delinquents and Nondelinquents: Implications for Etiology and Treatment

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The history of research in the areas of learning disabilities and juvenile delinquency has produced considerable speculation about a possible relationship between the two. While it has often been noted that delinquents are slow learners and may be learning disabled, this project, begun four years ago, has been working with the hypothesis that early, undiagnosed learning disabilities are a significant cause of the kind of lifestyle that results in delinquent behavior.

For years the impact of psychoanalytic theory has lead investigators to assume that delinquent behavior was primarily the result of personality or social disturbances originating in early childhood. More recently, however, advances in experimental sophistication have resulted in findings that significant numbers of delinquents show concrete, definable physiological differences from nondelinquents. Moreover, within the past two decades more specific, more regognizable symptoms have been identified as major causes of aggressive behavioral disorders. Laufer's (1957) hyperkinetic impulse disorder has been found by Denhoff (1969, 1970 and Knobel (1962) to cause specific sensory and perceptual deficits leading to school failure. Subsequent embarrassment and frustration lead to secondary behavioral symptoms, so that the affected children exhibit symptoms often considered purely behavioral.

Hare (1970, 1968) has suggested that repeated delinquents tend to have physiological systems that may make them hyporesponsive emotionally in situations that would ordinarily be expected to be anxiety-provoking for people. Delinquents simply don't have the constitutional equipment to make necessary emotional responses that lead to necessary social learning and adaptability.

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Finally, years of failure and increasing recidivism among young people have clearly demonstrated the failure of most current systems of delinquency "rehabilitation". The fact that 80% of the inmates of most correctional institutions are repeat offenders is startling testimony that rehabilitation simply hasn't occurred. This has lead us to question the very assumptions upon which most correctional treatment facilities are based. These assumptions usually have involved psychodynamic or social pathology as the root of delinquency. Yet these are all assumptions. Despite the funds being expended in attempts to rehabilitate adult and juvenile delinquents, there has been inadequate attention devoted to effective research regarding these basic assumptions. A major assumption of the current project has been that delinquency results from failure to detect significant skill deficits which predispose certain children to failure in school and in life. A vital step has been overlooked in the total plan of study of delinquency. Simply providing for a panoply of varied treatment programs is inadequate: we must determine which delinquents require which forms of treatment, and we must develop specific treatment programs tailored to meet the needs that have been determined. It doesn't help anyone to be part of a psychotherapy process if he doesn't understand most of what is going on around him. Effective rehabilitation can occur only after accurate diagnostic information determines the cause of delinquent behavior (Reitan, 1970).

It was with this purpose in mind that the Rhode Island Neuropsychology Laboratory was established in 1970, supported by grants from the United States Department of Justice, Law Enforcement Assistance Administration; and the Rhode Island Governor's Commission on Crime and Delinquency. For three years data has been collected and studied, and recent completion of necessary control groups makes it possible to examine the results for etiological and treatment implication.

A random selection of half of the newly-admitted boys at the Rhode Island Training Schools were examined at the lab as part of the Schools' routine intake procedure. They were administered the complete Halstead-Reitan battery, including the Wechsler Intelligence Scale appropriate for their age, the Wide Range Achievement Test, and a thorough interview and history. Preliminary analysis of the data from this group has been reported previously (Berman, 1973, 1974).

In addition, a demographic analysis of the training school population revealed that the cachement areas defined by two inner city high schools in Providence accounted for more than 82% of Training School admissions. It was therefore established that selection of a control group from boys at these high schools would be a reasonable control for socioeconomic status. Care was taken to assure that this was indeed the case. The control group was also selected to match for age and intelligence with the Training School population, and no individual with a history of delinquency was included.

Results

Sample means and standard deviations were computed on all of the tests for both the delinquent group and their controls. These values are presented in Table 1. The significance of the observed differences between pairs of sample means was tested statistically by using the t-test for matched samples, (Spence, et al, 1968).

The six sub-tests which comprise Reitan's examination for Sensory Imperception were collapsed and the total number of errors on all six sensory sub-tests constituted the raw score upon which the delinquent and non-delinquent sample means were computed. This composite score expresses sensory imperception in the auditory, tactile and visual modalities, as well as three additional measures of the intactness of tactile perception. These include fingertip number writing, tactile form recognition and a test of finger agnosia.

The results are striking. The delinquents performed more poorly on nearly all

measures of Wechsler's Psychometric Inteiligence and on all of Halstead's tests with the exception of the Rhythm and Finger Oscillation Tests. Their performance was also inferior to that of the controls on both Parts A ($P<.001$) and B ($P<.01$) of the Trailmaking Test.

The examination for Sensory Imperception failed to yield significant differences between the delinquents and their controls. Although the total time taken to complete the TPT ($P=.05$, was significantly greater for the delinquent group, it is noteworthy that when the TPT time score was analyszed on each trial, significant differences between the groups were observed on only one of the three trials (non-dominant hand) ($P<.05$).

Although in both groups the disparity of Verbal and Performance IQ favored the Performance value, the magnitude of this difference was significantly greater ($P<.005$) in the delinquent group.

In addition to the profile analysis which was yielded by inspection of the inter-group differences between sample means, the data was subjected to a discriminant analysis. Five predictors were utilized in the present study: (1) Verbal IQ, (2) Performance IQ, (3) Halstead's Impairment Index, (4) the Trailmaking Test Part A and (5) Part B. The rationale for the selection of this set of predictors was based on the fact that the first two measures are relatively non-redundant summary scores which reflect Ss' performance on all of the Wechsler scales. The Impairment Index was selected since it, too, is a summary measure which reflects the level of performance on all of Halstead's tests. The Trailmaking Tests are included in neither of these summary measures and were therefore included separately. Rao's Generalization of the Mahalanobis D^2 Technique was run on Bio-Med's M-5 Program for Discriminant Analysis for Two Groups (Wilcox, 1973). The value of the Mahalanobis D^2 was found to be 59.50, which reaches statistical significance at the .001 level. This indicates that the differences which exist between the groups' profiles on the five predictor variables are so marked that they could

occur by chance fewer than one out of one thousand times. Using the group profiles on these five predictors, a classification matrix was constructed. This matrix summarizes the correct and incorrect classifications of all Ss in the experiment as either delinquent or non-delinquent on the basis of the patterning of the neuropsychological test performances as assessed by the five predictor variables. Results illustrated that 87 percent of the delinquents and 78 percent of their controls could be correctly classifed on the basis of these five neuropsychological indices. It is apparent, then, that although some minimal overlap between delinquents and their controls exists, the level of performance and the patterning of the abilities and deficits is markedly different for the two groups. The most powerful predictors were PIQ and the Impairment Index, followed closely by VIQ. The Trailmaking Test contributed to the discrimination, although to a somewhat lesser degree than the aforementioned measures.

DISCUSSION

Discussion will focus upon the following general areas.

1) Specific tabular presentation and detailed description of the significance of the results.
2) Detailed, specific enumeration of the types of disabilities found and their relationship to the general literature on learning disabilities.
3) Implications for early prediction of these disabilities.
4) Implications for remediation and rehabilitation.

The results will be discussed as support for the initial assumption that, in a significant amount of delinquents, learning or skill deficiencies are a basic etiological element. A more thorough discussion of the process by which the skill deficits introduce a cycle of failure, progressive disability and secondary emotional problems, will also be presented.

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